



Attachment 2: Table of Comments on the EPA’s Draft Geotechnical GP for the Beaufort and Chukchi Seas

#	ODCE Criterion	Document and Reference Section	Permit Language	Shell Comment	EMP Implication
1.		Fact Sheet, p. 7	<p>“Geotechnical surveys are short in duration and, depending on targeted depth, range between 1 to 3 days to complete.”</p> <p>“...activities authorized under the Geotechnical GP are similar in nature to those discharges associated with exploration drilling activities, but at much lower volumes” relative to discharges resulting from exploratory drilling activities.</p>	Geotechnical activity is limited in duration. This limited duration combined with the limited spatial extent of deposition (vertical and horizontal) does not result in significant deposition in the environment. This is known <i>a priori</i> and it negates the need for an EMP.	
2.		ODCE, Overall Conclusions, p. 6-26	<p>“EPA has evaluated the 12 discharges for the Geotechnical GP against the ocean discharge criteria. Based on this evaluation, EPA concludes that the discharges will not cause unreasonable degradation of the marine environment under the conditions, limitations, and requirements established by the permit.”</p> <p>“Together, those studies suggest that bioaccumulation of trace metals from water-based drilling fluids is low and reversible.” (p. 6 - 27)</p> <p>“...In the discharge area, the effects are limited to the small discharge area and have been shown to have few long-term impacts” (relevant to benthic organisms) (p. 6-27)</p> <p>“These studies demonstrate that discharge of drilling fluids and cuttings will not result in an unreasonable degradation of the marine environment during or after discharge activities.” (p. 6-27)</p> <p>“Finally, the discharges from geotechnical surveys and related activities are very short in duration and long-term widespread impacts are not anticipated. (p. 6-27)</p>	Shell would argue that the operational discharge requirements in the draft Geotechnical GP <i>alone</i> (i.e., effluent limitations as presented in Tables 1 - 12) are more than sufficient to protect the marine environment. The criteria evaluations included in the EPA's ODCE do not justify, either individually or when combined, the inclusion of an EMP to the final Geotechnical GP.	The EPA’s Effluent Limitations Guidelines (ELGs) are promulgated as regulations and —where applied — these ELGs are “protective of the marine environment.” The reader is directed to the Alaska Department of Environmental Conservation Geotechnical GP ODCE, which does a more thorough job of explaining the rationale behind the ELGs. The application of the ELGs reinforces the manner in which the marine environment will be protected even if the final Geotechnical GP does not include an EMP requirement.



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3.	Bioaccumulation and/or Persistence	ODCE, Criterion 1, p. viii	“The discharges from geotechnical surveys and related activities to federal waters are not expected to cause an unreasonable degradation of the marine environment because pollutants associated with those discharges are not bioaccumulative or persistent”	The fact that the EPA does not articulate concerns in the ODCE related to bioaccumulation or persistence indicates that an EMP requirement is not necessary and is unduly burdensome. The questions that the EMP requirements are intended to answer have already been answered by prior work published in the literature and current available information. There is no justification for EMP requirements backed by criterion 1 evaluation.	The EMP is not necessary because the ODCE concludes that the discharges are not bioaccumulative or persistent.
4.	Potential for Transport	ODCE, Criterion 2, p. viii and ix and Fact Sheet, p. 10	<p>The potential transport “...effects would be limited by the short duration of activity...and the quantity and composition of discharges.”</p> <p>“Due to the short duration of geotechnical borehole drilling and related activities...effects are likely to occur in a limited area and the extent and duration of effects are expected to be short term.”</p> <p>“Drilling fluid and cuttings deposition will not result in significant accumulations on the seafloor”</p>	Indeed, limited duration and short-term effects of geotechnical discharge are indicated by the results of the EPA 2D advection diffusion equation model, which demonstrate insignificant deposition beyond 1 meter from the borehole location. Specifically, “at 100 meters across all current speeds and discharge rates, the thickness of deposition for the combined discharge of drilling fluids and drilling cuttings ranges from 0.04 to 3 millimeters.” These are negligible depositions and are confined to a small spatial scale, both horizontally and vertically, and which do “not result in significant accumulations”. These findings negate the need for a post-drill (Phase II) EMP requirement in final Geotechnical GP. There is no justification for EMP requirements backed by criterion 2 evaluation.	The EMP is not necessary because the ODCE concludes that the short duration discharges will not result in significant accumulations on the seafloor.
5.	Vulnerability of Biological Communities	ODCE Criterion 3, p. x	“EPA has completed a Biological Evaluation (BE) on the effects of authorized discharges on endangered, threatened, proposed, and candidate species. The BE concluded that the discharges ‘may affect, but are not likely to adversely affect’ ESA listed, candidate, and proposed, species, or their designated critical habitat areas.”	Given this conclusion, there is no justification for EMP requirements backed by criterion 3 evaluation.	The EMP is not necessary because the ODCE concludes that the short duration discharges are not likely to adversely affect critical species. Additionally, the EMP data collection requirements will not answer these questions.
6.	Existence of Special Aquatic Sites	ODCE, Criterion 5, p. xi	“No marine sanctuaries or other special aquatic sites, as defined by 40 CFR 125.122, are in or adjacent to the Geotechnical GP Area of Coverage.”	Given this conclusion, there is no justification for EMP requirements backed by criterion 5 evaluation.	The questions the EMP is attempting to answer are already decisively answered by the information provided in the ODCE.



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7.	Potential Impacts on Human Health	ODCE, Criterion 6, p. xi	“Current levels of contamination in subsistence food sources are low.”	An EMP requirement is not necessary to limit contamination in subsistence food sources because the preceding criterion (e.g., bioaccumulation and persistence potential) addresses potential contamination issues. There is no justification for EMP requirements backed by criterion 6 evaluation. The narrative comments included in Attachment 1 further address the lack of need for seasonal whaling closures in the Geotechnical GP.	Bioaccumulation potential and persistence of chemicals in the environment drive the likelihood of potential impacts on human health. The EMP is not necessary because the ODCE concludes that the discharges are not bioaccumulative or persistent.
8.	Existing or Potential Recreational and Commercial Fishing	ODCE, Criterion 7, p. xii	“Based on the limited duration of the discharges authorized and the limits and requirements established in the Geotechnical GP, it is not expected that the discharges would affect fishing success or the quality of the fish harvested.”	Given this analysis, there is no justification for EMP requirements backed by criterion 7 evaluation.	The questions the EMP is attempting to answer are already decisively answered by the information provided in the ODCE.
9.	Applicable Requirements of a Coastal Zone Management Plan	ODCE, Criterion 8, p. xii	Not Applicable.	The State of Alaska does not have an approved Coastal Zone Management Plan. There is no justification for EMP requirements backed by criterion 8 evaluation.	This criterion is not relevant at this time because the State of Alaska does not currently have a CZMP. This criterion does not justify the inclusion of the EMP in the GT permit.
10.	Additional Other Factors Relating to Effects of Discharge	ODCE, Criterion 9, p. xii	“EPA has determined that the discharges authorized by the Geotechnical GP will not have disproportionately high and adverse human health or environmental effects with respect to the discharge of pollutants on minority or low - income populations living on the North Slope, Northwest Arctic, and St. Lawrence Island, particularly the coastal communities.”	Given this analysis, there is no justification for EMP requirements backed by criterion 9 evaluation.	The questions the EMP is attempting to answer are already decisively answered by the information provided in the ODCE.
11.	Marine Water Quality Criteria Pursuant to CWA Section 304(a)(1)	ODCE, Criterion 10	“Because the effluent limitations and requirements contained in the permit comply with federal water quality criteria, EPA concludes that the discharges will not cause an unreasonable degradation of the marine environment.”	Given this analysis, there is no justification for EMP requirements backed by criterion 10 evaluation.	The questions the EMP is attempting to answer are already decisively answered by the information provided in the ODCE.
12.		ODCE, p. 1-2	“On the basis of the analysis in this ODCE, the RA will determine whether the general permit may be issued. The RA can make one of three findings...”	Based on the ODCE conclusions, Finding 1 is justified: “ [t]he discharges will not cause unreasonable degradation of the marine environment and [the EPA should] issue the permit.”	



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13.		ODCE, p. ii	“The discharges from oil and gas geotechnical surveys and related activities authorized under the Geotechnical GP are similar in nature to those discharges associated with exploration drilling activities, BUT AT MUCH LOWER VOLUMES” (p. ii).	It takes significantly less time to drill a geotechnical borehole than it does to drill an exploration well. Further, drilling a geotechnical borehole will result in substantially less discharges. It is therefore not appropriate to require similar EMP monitoring to geotechnical activities as is required for exploratory drilling.	
14.		ODCE, p.ii	“EPA also assumes drilling fluids would not be used for geotechnical related activities” (p. ii).	This statement conflicts with the inclusion of D001 and the EMP requirements in the permit.	
15.		ODCE, p.2-1	“Geotechnical related surveys and related activities will include collection of soil borings...”	Using the word “collection” is inconsistent with the process of conducting geotechnical soil borings.	
16.		ODCE	Throughout document, for example p. (“nautical miles”) and p. 2-1 (“kilometers apart”)	Inconsistent use of kilometers and miles to characterize distance between boreholes.	
17.		ODCE, p.2-1	Section 2.1, fourth paragraph.	The description of geotechnical related activities is not accurate. The ODCE assumes that the discharge would be equivalent to half of an MLC whereas the definition of “geotechnical related activities” is much broader and should evaluate more reasonable level of activity.	It is unreasonable to assess potential impacts of geotechnical discharges using unrealistic or overly conservative assumptions.
18.		ODCE, p.2-3	Section 2.1, tenth paragraph	Description of conventional rotary drilling for geotechnical surveys correctly indicates that the use of additives and drilling fluid is typically not required (but if drilling fluid/muds were warranted multiple batches would be mixed daily). The focus throughout the ODCE, however, is based on an assumption that drilling fluids with additives will be used for each borehole.	It is unreasonable to assess potential impacts of geotechnical discharges using unrealistic or overly conservative assumptions.
19.		ODCE, p.2-3	Section 2.2. The comparison of geotechnical surveys to exploration activities	Several significant differences between these activities are not identified, including type of discharge, cutting size and depositional pattern.	
20.		ODCE, p.2-3	A detailed description of these activities is provided in Section 2.1	There is no detailed description of conventional methods of coring (just a few sentences), nor of “related activities.”	The text in these sections of the ODCE indicates a significant lack of understanding of the physical activities associated with geotechnical surveys. EPA should modify the ODCE to more adequately characterize these activities.



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21.		ODCE, p.2-4	As discussed in Sections 3.1 and 3.2, the discharges from oil and gas geotechnical surveys and related activities authorized under the Geotechnical GP <i>are similar in nature</i> to those discharges associated with exploration drilling activities.	The premise that the exploration drilling discharges and geotechnical discharges are similar in nature is incorrect. The discharges associated with geotechnical borings are significantly lower in volume and have less potential environmental impacts than the discharges associated with an exploration program. Moreover, Shell does not anticipate using muds except in deeper borings, and we do not anticipate deeper borings to constitute a substantial part of our geotechnical programs. <i>If</i> drilling muds are used, the volumes are minimal and extremely short term in duration (e.g. a few hours for a single day (geotechnical) versus intermittently for approximately 30 days (exploratory drilling). Sections 3.1 and 3.2 do not demonstrate that the discharges are similar in nature.	
22.		ODCE, p.3-1	No discharge of any waste stream onto stable ice	The draft Geotechnical GP does not define “stable ice.”	



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23.		ODCE, p.3-2	Section 3.1, last paragraph: “Barite is a concern because it is known to contain trace contaminants of several toxic heavy metals such as mercury, cadmium, arsenic, chromium, copper, lead, nickel, and zinc.”	The author does not appear to understand current industry practice or current manufacturing practices for barite in the U.S. and the fact that constituents of concern are present at extremely low concentrations. Additionally, the trace quantities of heavy metals in barite have been subject to regulatory controls for many years. The barite mining practices over the years have been improved to result in low concentrations of any co-occurring metals with the barite (BaSO4), the concentrations of which are well below any ecologically-relevant and toxicologically-relevant thresholds. (Trefry and Smith 2003) The Petroleum Equipment Suppliers Association (PESA) developed a barite certification program and it is commonly used by drilling fluids companies to document that their products conform to the offshore limits for mercury and cadmium. For many years drilling fluid suppliers have been providing barite that meets the discharge limits. During the Effluent Limitation Guidelines development process the EPA documented that control of mercury and cadmium indirectly controls other heavy metals. (EPA 821 -R-93-003 Page VI -4). Several previous scientific studies have demonstrated that low levels of heavy metals found in commercial supplies of barite do not pose a significant environmental risk when discharged into the marine environment.	
24.		ODCE, p.3-7	All boreholes are assumed to require the use of water-based drilling fluids and drill cuttings, though in reality, most shallow boreholes may only utilize seawater.	This assumption is overly conservative and unrealistic assumptions result in unrealistic potential impact conclusions.	
25.		ODCE, p.3-8	Predictive modeling of discharges.	The currents used for modeling are not representative of conditions in the nearshore environment.	



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26.		ODCE, p.4-4 and 4-5	Description of the existing physical environment.	The amount of information presented in these sections is extremely limited and appears to only be based on older NEPA documents. Newer and more comprehensive information on currents and circulation patterns in the northeastern Chukchi Sea have not been incorporated.	
27.		ODCE, p.4-6 and 4-7	Section 4.3 Ice	These sections are primarily focused on the Beaufort Sea.	
28.		ODCE, p.4-7	Section 4.4 Sediment Transport	There is no substantial discussion of the magnitude of natural sediment transport, specifically sedimentation rates in relation to the predicted deposition.	This critical factor should be described in the ODCE because it would further demonstrate that geotechnical discharges on the seafloor are negligible.
29.		ODCE, p.4-8	Section 4.5 Water and Sediment Quality	Although some information provided by industry is included, the overall amount of information on water and sediment quality is very limited. In addition, the Shell (2013) citation is not included in the reference section.	It is unreasonable that the same level of information as is being required by the EMP is not included in the ODCE. The requirement for an EMP is not justified especially when other available reports on sediment chemistry in the Chukchi Sea are not included.
30.		ODCE, p.5-2	Section 5.1 Plankton	There is significant information missing from oceanographic surveys conducted in 2008, 2009, 2010, 2012, and 2013.	
31.		ODCE, p.5-3	Section 5.3 Benthic Invertebrates	This section is written at an extremely broad, textbook-type manner and includes many statements that are not necessarily applicable to U.S. Arctic conditions. In addition, nearshore lagoons are generally shoreward of the 3 -mile limit and therefore not part of the federal geographic scope.	The text in these sections of the ODCE indicates a significant lack of understanding of the existing natural conditions and results in unrealistic and overly conservative assumptions about potential impact.
32.		ODCE, p.5-4	Section 5.3 Benthic Invertebrates “Benthic communities can change in response to the following:”	The language in this section reflects a dramatic bias towards negative consequences of seafloor discharge. The bullet list ignores several other natural factors that regularly cause significant change to benthic communities, including, for example: changes in depositional environment over time, ice formation and resultant scouring, and seafloor disturbances attributable to walrus/seal/gray whale feeding activities.	
33.		ODCE, p.5-4	Section 5.3 Benthic Invertebrates “Physical smothering of habitat due to deposition of drilling fluids and cuttings materials discharged on the ocean floor.”	Physical smothering due to deposition may affect certain individuals, but is not at all likely to result in community level changes.	
34.		ODCE, p.5-4	Section 5.4 Fish; “The Chukchi Sea is characterized by sub -arctic climate, especially during the open-water season in the later spring and summer.”	This statement is incorrect and reflects a poor understanding of the existing environment. It is well-accepted that the Chukchi Sea is habitat for cold-adapted fish species that exhibit unique ecological characteristics.	



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35.		ODCE, p.5-16	Section 5.9, Subsistence Activities and Environmental Justice Considerations.	Increased traffic and time on site because of the requirements of the EMP has the potential to cause substantial impact on subsistence activities that has not been evaluated in the ODCE	
36.		ODCE, p.5-15 to 5-21	Sections 5.9 and 5.10	Repeated reference is made to SRB&A 2011, which is a traditional knowledge and stakeholder engagement workshop conducted exclusively to assess potential concerns and issues associated with exploratory oil and gas drilling. It is unreasonable to use outcomes from this workshop to then create numerous restrictions and EMP requirements associated with a geotechnical program. The workshop proceedings are also not available to the public for review.	
37.		ODCE, p. 6-6	Section 6.1.5	Historically, the presence of potentially toxic concentrations of trace elements in drilling fluids was a concern. The ODCE incorrectly cites concentrations from drilling fluid studies in the 1980s. Barite used in drilling during the 1980s is not representative of barite used today. In 1993, the EPA established regulations for the maximum concentration of Hg and Cd in barite ore that can be used in drilling fluids in the U.S. OCS. These facts are ignored in the ODCE.	
38.		ODCE, p.6-7	“Additional permit requirements include no discharge during bowhead hunting activities in the Beaufort and Chukchi Seas...”	There is absolutely no linkage between substantive impacts and the additional permit requirement. See Narrative Comments for comment on the seasonal whaling closures.	There is no established reasoning that discharge blackout during whaling will increase the likelihood that bioaccumulation or persistence in the environment will continue to not occur.
39.		ODCE, p.6-7	“Little information is available to assess the biomagnifications of drilling fluid discharges components; however, one study suggests that barium and chromium could magnify.	This statement is completely biased and not objective. The author completely ignores numerous studies conducted since the 1980s that demonstrates that bioavailability and bioaccumulation are negligible. Instead, the author focuses only on the oldest of the studies and only a single study.	
40.		ODCE, p.6-8	The Geotechnical GP prohibits all discharges on the ice surface.	There is no justification in the ODCE for this prohibition. The ODCE fails to reference or summarize the many years of studies beginning in the 1980s regarding on-ice disposal, which indicate that environmental impacts were typically not identified after sea ice melt.	
41.		ODCE, p.6-10	Section 6.2.4	Replace the word “absorbed” with “adsorbed”.	



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42.		ODCE, p.6-12	Section 6.3.2	The language in this section is vague and fails to mention that deposition greater than 1 cm is only for two cases in Table 6-2.	
43.		ODCE, p.6-20	Section 6.9.1, fourth paragraph.	The ODCE clearly states repeatedly that geotechnical surveying discharges will not result in adverse impacts under the criteria.	No justification for the EMP.
44.		ODCE, p.6-20	Section 6.9.1, fifth paragraph. “Additionally, under the CWA, EPA has the authority to make modifications or revoke permit coverage if it identifies a basis to conclude that discharges will cause an unreasonable degradation of the marine environment.”	Nowhere in the ODCE is there any <i>basis</i> for the draft Geotechnical GP prohibition of discharges during whaling, EMP requirements, effluent toxicity characterization requirements, or prohibition of on-ice disposal.	
45.		NPDES Geotechnical GP, Title	AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) FOR OIL AND GAS GEOTECHNICAL SURVEYS AND RELATED ACTIVITIES IN FEDERAL WATERS OF THE BEAUFORT AND CHUKCHI SEAS	As indicated by the title, the EPA has limited coverage under its permit to geotechnical activities undertaken for "oil and gas" related purposes. Geotechnical surveys are not unique to the oil and gas industry. There is no justification for the EPA to regulate discharges associated with oil and gas geotechnical surveys differently than it would regulate discharges associated with these same surveys if they were undertaken by a different industry or the government. The scope of coverage under the proposed APDES permit is not limited to geotechnical discharges associated with oil and gas activities. The EPA should broaden the scope of coverage in its proposed permit so that it is consistent with the scope of coverage under the proposed APDES permit	
46.		NPDES Geotechnical GP, p. 10, FIGURE 1	Area of Coverage for oil and Gas Geotechnical Surveying and Related Activities in federal Waters of the Arctic Ocean.	The map of the coverage area, presented as Figure 1, extends beyond U.S. waters. Given that the EPA does not have jurisdiction under the CWA to regulate discharges in international waters, the map of the coverage area should be reformed in the final permit.	
47.		NPDES Geotechnical GP, Section I.A, p. 11	Geotechnical “related activities” also result in a disturbance to the seafloor and produce similar discharges. Such related activities may include feasibility testing of mudline cellar equipment or other equipment that disturbs the seafloor, and testing and evaluation of trenching technologies.	See Narrative Comments for discussion of coverage associated with execution of a MLC from a geotechnical vessel.	



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48.		NPDES Geotechnical GP, Section I.C.1, p. 11	A first time NOI submission is required for: (1) each facility (not previously covered under the Geotechnical GP), and (2) for each coverage area zone within which that specific facility will operate (as depicted in Figure 1).	One NOI should be sufficient for the vessel for the entire geotechnical program in a given year. Requiring multiple NOIs for the same activity significantly increases the administrative burden of complying with the permit with no appreciable environmental benefit. The Blocks and or Lots should be shown on Figure 1 so it is easier to understand each coverage area zones.	
49.		NPDES Geotechnical GP, Section II.A.13.a, p. 17	Echinoderm Rapid Automated Toxicity Test. The permittee must conduct the echinoderm fertilization test (Section 16 of EPA/600/R95 - 136) once (1) per week, or once (1) per discharge event if the waste streams are discharged during batch events, if the permittee is authorized to discharge the waste streams listed in Permit Part II.A.13.b. (above).	Shell recommends that the Echinoderm Rapid Automated Toxicity Test requirement be removed from permit. The SPP toxicity testing alone is sufficient for evaluation of any toxicity associated with the geotechnical drilling operations, If D001 is used, it will be comprised primarily (96%) of seawater. Other drilling fluid constituents relied on for geotechnical borings include simple viscosifiers such as xanthan gum and bentonite clay, which are used to clean cuttings from the wellbore. Additionally, small quantities of other products may be used to maintain hole stability. These products are similar to those used to drill water wells in other applications. The products that are required for exploration drilling to keep much deeper and larger holes stable and to control subsurface pressures are not required to drill simple geotechnical borings. The other “vessel” discharges should not require Echinoderm Rapid Automated Toxicity, or any other type of toxicity testing, as they have already been found under other permitting authorities not to be pose an environmental risk. This requirement is not justified by the ODCE and furthermore increases the safety and environmental risks and cost due to the significant logistical support needed to meet his requirement.	
50.		NPDES Geotechnical GP, Section II.A.13.a, p. 17	The permittee must conduct the echinoderm fertilization test (Section 16 of EPA/600/R95 - 136) once (1) per week, or once (1) per discharge event if the waste streams are discharged during batch events, if the permittee is authorized to discharge the waste streams listed in Permit Part II.A.13.b. (above).	The text of Section II.A.13.a references "Section II.A.13.b (above)[.]" However, this section does not exist. Nonetheless, Shell recommends removing this requirement for the above-stated reasons.	



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51.		NPDES Geotechnical GP, Section II.A.14, p. 19	The permittee must design and implement an environmental monitoring program (EMP) for geotechnical surveys and/or related activities.	There is no justification for the EMP Requirement in draft Geotechnical GP. The purpose of the ODCE is to evaluate if unreasonable degradation is likely to ensue as a result of the specific proposed activity. The ODCE definitively states that the proposed activities within the effluent limitation confines of the permit will not cause unreasonable degradation of the environment. (EPA 2013 , page xiii) Consequently, there is no scientifically valid rationale for inclusion of the EMP in the Geotech NPDES permit.	
52.		NPDES Geotechnical GP, Section II.A.14.b.1, p. 20	Complete baseline site characterization, including physical sea bottom survey, to ensure the authorized discharges do not occur on or near a sensitive biological area or habitat;	This requirement is not necessary because the permittee already conducts pre-deployment site characterization to avoid sensitive areas and to ensure that equipment will not be compromised during deployment. Shell and other operators typically site geotechnical boreholes on pre-existing shallow hazard or ice gouge survey lines. This allows the operator to review the existing geophysical report(s) and identify any potential subsurface factors that could complicate boring and to determine if there are any potential archaeological or historically significant sites near the planned borehole. If any such site is identified, boreholes are re-sited prior to the operator even entering the coverage area. Shell also generally sites boreholes on pre-existing geophysical lines to ensure there are no seafloor obstructions that may be in the way such as an old wellhead, structure or pipeline. Boreholes are also sited on pre-existing lines as a matter of efficiency. This practice generally allows the operator to extend the information we find in a lateral direction, some distance away from the borehole without having to go back out and drill another boring.	



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53.		NPDES Geotechnical GP, Section II.A.14.b.3, p. 20	Evaluate areal effects of solids deposition associated with Discharge 001 at the seafloor;	Shell recommends that this requirement be deleted. As acknowledged by the EPA in the ODCE, "[t]he anticipated areal extent and depositional thicknesses of the drilling fluids and drill cuttings materials from both activities will not cause long-term effect by the receiving biological and physical marine environment" (EPA 2013, 6 -24). This is not a reasonable objective because the relevant discharges are of limited volume and discharged at the seafloor, which precludes significant area distribution. Further, the permit includes in other sections effluent limitations and monitoring requirements that already answer the relevant questions --what is entering the receiving waters as a result of these activities?" The answer to this question is that there is the potential for trace concentrations of Hg and Cd to be introduced through D001, but D001 already requires testing for these metals. Further, the permit includes concentration limits to ensure the protection of the environment. The concentration limitations in the permit were originally developed and implemented to protect the marine environment (EPA 1993). Furthermore, the bioavailability of any associated metals is low (e.g., Trefry and Smith 2003, Crecelius et al. 2007) , which is in part why the ODCE concludes that bioaccumulation likelihood is low. It should be noted that bioaccumulation is not biomagnification. Bioaccumulation is a transient, reversible nominal increase in chemical concentration in biota compared to the organisms environment, e.g., water or sediment or food sources.	



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54.		NPDES Geotechnical GP, Section II.A.14.d, p. 21	Phase I Assessment.	There are prior and ongoing studies in both the Chukchi and Beaufort Seas funded by both industry and government agencies that provide data equivalent to that required for the Phase I component of the EMP. This includes data from past MMS- and Shell-funded studies in the Beaufort Sea (e.g., ANIMIDA, cANIMIDA) and BOEM-funded ANIMIDA III in the Beaufort Sea, as well as the industry-funded (Shell, Statoil, Conoco) data collection in the Chukchi Sea and the BOEM-funded research in the Chukchi Sea (COMIDA-CAB, COMIDA-Hanna Shoal), among other research programs. The EPA is encouraged to review, for example, the 2013 special journal publication of Continental Shelf Research (Volume 67, September 15, 2013 issue, pages 1 - 166), which summarizes the past five years of baseline data collection in the Chukchi Sea region. Given the existing published baseline data, Shell recommends removing the Phase I Assessment requirement in the permit.	



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55.		NPDES Geotechnical GP, Section II.A.14.d.2, p. 21	Physical Characteristics. Collect physical data to characterize the conditions of the geotechnical activity site and receiving waters. These physical data include surface wind speed and direction, current speed and direction throughout the water column, water temperature, salinity, depth, and turbidity.	See comment above for Phase I data. The requirements for data collection in the draft Geotechnical GP are not streamlined and in essence require repeat data collection. Scientists already have an excellent, overall understanding of physical oceanography conditions and characteristics of the Beaufort and Chukchi Seas. For example, in the Chukchi Sea, publications by T. Weingartner demonstrate significant research conducted over time (e.g., Weingartner et al. 2013. Continental Shelf Research 67. p.5 -22). These monitoring requirements will increase the cost of geotechnical activities, decrease available time during an already short open water season, and are duplicative of Arctic metocean data gathering efforts. The ODCE indicates that turbidity increases from geotechnical activities are not expected, and therefore the requirement in the draft Geotechnical GP to monitor turbidity is without basis. "The solid component of water - based drilling fluids and cuttings (001), cuttings not associated with drilling fluids (011), and cement slurry (012) are not expected to contribute significantly to turbidity in the water column as the discharges occur at the seafloor." (EPA 2013, Section 6.3.1) Additional justification of effluent limits in the Geotechnical GP being protective of turbidity is included in the ODCE (EPA 2013, Section 6.10.5) . The ODCE does not indicate data gaps requiring additional information on physical process at play. Indeed, it documents and even models physical transport processes including currents and wind in both the Beaufort and Chukchi seas using existing data. (EPA 2013, Section 4.1.3, 6.2.2.) The requirement to collect meteorological and current data presents operational challenges will likely necessitate an additional vessel in addition to monitoring buoys, and is not justified given the amount of data already available.	
56.		NPDES Geotechnical GP, Section II.A.14.f.1, p. 21	The permittee must notify the Director, in writing, 7 calendar days from receipt of the physical sea bottom survey data, if the data indicates the proposed geotechnical activity is located in or near a sensitive biological area, habitat, or in the vicinity of historic properties.	It is not clear what happens if a permittee is in or near one of these areas. This process that the EPA will engage in with a permittee following this notification should be described in the final Geotechnical GP.	



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57.		NPDES Geotechnical GP, Section II.A.14.g, p. 22	The EMP may be modified if the Director determines that the modification is appropriate. Modifications to the EMP may include changes in sampling location, changes in sample frequency, or changes to parameters to be monitored. This determination will be made by the Director upon receipt of the first -time NOI and/or annual NOI renewal package.	The EMP requirements are not supported. However, assuming the EMP requirement was justified and the EPA carried it forward to the final Geotechnical GP, this language creates numerous questions as to how an EMP could be modified. Does this mean the EMP may only be modified once per year during the annual renewal review? Would changing a part of the EMP constitute a violation of the permit terms and conditions if the modification was requested outside of the annual renewal? This extremely specific allowance for modifications to the EMP, which is an extremely complex and logistical ly challenging program, gives no operational flexibility and is another reason why the EMP as written will be impossible to implement.	



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#	ODCE Criterion	Document and Reference Section	Permit Language	Shell Comment	EMP Implication
58.		NPDES Geotechnical GP, Section II.B.3, p. 25	The permittee must analyze each drilling fluids system for the metal contaminants of concern (see Table A). This analysis is required once (1) per batch of drilling fluids mixed at the facility. If a new mixture of drilling fluids is created, or a new drilling fluids system is used during the geotechnical activities program, then an additional metals analysis is required for the new batch.	<p>The metals analysis required by the draft Geotechnical GP is not justified by the data presented in the ODCE. The metals listed on Table A are implicated by exploration drilling, not geotechnical boring. The only metals of concern for a geotechnical program are the chromium, mercury and sulfides found in barite. They are not easily absorbed by the marine life and can be pre-tested for concentrations from the mud we purchase for use each season. A permittee is aware of the volumes of mud used at each boring location and can calculate the quantity of metals discharged at a site.</p> <p>There is inconsistency between the draft Geotechnical GP language and the ODCE regarding the frequency with which this testing would be required. As drafted, the permit requires this testing for each “batch,” but the EPA does not define “batch.” If drilling fluids/muds are warranted at a particular borehole, Shell plans to utilize in its geotechnical programs a n eight hundred gallon pit or “batch” about every twenty feet of borehole drilled. Shell does not anticipate using muds except in deeper borings, and we do not anticipate deeper borings to constitute a substantial part of our geotechnical programs. However, when drilling deeper boreholes Shell plans to mix up a new “batch” of drilling muds approximately every twenty feet of borehole drilled. Given this frequency, the SPP requirement would necessitate that Shell perform SPP toxicity testing multiple times per day while conducting geotechnical activities. This does not seem to have been the EPA’s intent, given that the ODCE provides that “one batch of drilling fluids would be used during the season” (EPA 2013, 3-4). The ODCE also states (incorrectly) that a “single batch of fluids [will be used] to drill multiple geotechnical boreholes” (EPA, 2 -2). This will necessitate that this testing be performed multiple times a day. From the ODCE, it does not appear to be the EPA’s to require this testing so frequently.</p>	



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#	ODCE Criterion	Document and Reference Section	Permit Language	Shell Comment	EMP Implication
59.		NPDES Geotechnical GP, Section II.B.3, p. 25	Water-Based Drilling Fluids Metals Analysis. The permittee must analyze each drilling fluids system for the metal contaminants of concern (see Table A). This analysis is required once (1) per batch of drilling fluids mixed at the facility. If a new mixture of drilling fluids is created, or a new drilling fluids system is used during the geotechnical activities program, then an additional metals analysis is required for the new batch.	There is inconsistency between the draft Geotechnical GP and the ODCE regarding what "batch" means and the frequency with which batch testing for metals would be required. The ODCE states that "...it is expected that one batch of drilling fluids would be used during the season." (EPA 2013 , page 3 -4). The EPA should clarify this language and standardize the requirement between Section II.B.3 and TABLE 1: Effluent Limitations and Monitoring Requirements for Water-Based Drilling Fluids and Drill Cuttings (Discharge 001) so that it is clear that testing is only required once per drilling season, unless a new lot is supplied and mixed.	
60.		NPDES Geotechnical GP, Section II.B.4.a, p. 26	Spring Bowhead Whale Hunting Restrictions (Chukchi Sea). The permittee is prohibited from discharging water-based drilling fluids and drill cuttings (i.e., Discharge 001) to federal waters of the Chukchi Sea during spring bowhead whale hunting by the communities of Barrow, Point Hope, Point Lay and Wainwright.	See Cover Letter and Narrative Section relating to Whaling Closures- Section I.	
61.		NPDES Geotechnical GP, Section II.B.4.a.1, p. 26	The permittee must cease Discharge 001 starting on March 25 and may not resume discharging until after whaling activities are completed, as determined by coordination with the Alaska Eskimo Whaling Commission (AEWC).	See Cover Letter and Narrative Section relating to Whaling Closures- Section I.	
62.		NPDES Geotechnical GP, Section II.B.4.b, p. 26	Fall Bowhead Whale Hunting Restrictions (Beaufort Sea). The permittee is prohibited from discharging water-based drilling fluids and drill cuttings (i.e., Discharge 001) to federal waters of the Beaufort Sea during fall bowhead whale hunting by the communities of Barrow, Nuiqsut, and Kaktovik.	See Cover Letter and Narrative Section relating to Whaling Closures- Section I.	
63.		NPDES Geotechnical GP, Section II.B.4.b.1, p.26	The permittee must cease Discharge 001 starting on August 25, and may not resume discharging until after whaling activities are completed, as determined by coordination with the AEWC.	See Cover Letter and Narrative Section relating to Whaling Closures- Section I.	



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#	ODCE Criterion	Document and Reference Section	Permit Language	Shell Comment	EMP Implication
64.		NPDES Geotechnical GP, Footnote 6, p. 28	The permittee must analyze a representative initial sample of stock barite prior to drilling at the first geotechnical borehole location of the calendar year and submit the results with the DMR for the month in which operations commence. If any analytical result exceeds the mercury or cadmium effluent limitations in Table 1, the permittee must report the results to the Director in accordance with Section III.G., including the twenty-four hour notice of noncompliance requirement, of this general permit. If the permittee uses the same supply of stock barite to replenish the mud pit during the season’s operations, the permittee may submit the same analysis if no new supplies of barite have been received since the prior analysis. In this case, the DMR should state that no new barite was received since the last reported analysis.	The language of Footnote 6 in the draft Geotechnical GP further confuses the definition of "batch." The EPA should clarify this language to demonstrate that testing is only required once per drilling season, unless a new lot of barite is supplied and mixed.	
65.		NPDES Geotechnical GP, Table 1, p. 27	SPP Measurement frequency: once per batch	There is inconsistency between the draft Geotechnical GP and the ODCE regarding what "batch" means and the frequency with which batch testing for metals would be required. "...it is expected that one batch of drilling fluids would be used during the season." (EPA 2013, page 3-4). The EPA should clarify this language to demonstrate that testing is only required once per drilling season, unless a new lot of barite is supplied and mixed.	



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66.		NPDES Geotechnical GP, Table 1 Footnotes, p. 28	Note 6: Dr y weight in the stock barite. Results must be expressed as mg/kg (dry weight) of barite. The permittee must analyze a representative initial sample of stock barite prior to drilling at the first geotechnical borehole location of the calendar year and submit the results with the DMR for the month in which operations commence. If any analytical result exceeds the mercury or cadmium effluent limitations in Table 1, the permittee must report the results to the Director in accordance with Section III.G., includi ng the twenty -four hour notice of noncompliance requirement, of this general permit. If the permittee uses the same supply of stock barite to replenish the mud pit during the season's operations, the permittee may submit the same analysis if no new supplies of barite have been received since the prior analysis. In this case, the DMR should state that no new barite was received since the last reported analysis.	Again, this note is inconsistent with the metals sampling requirements indicated in Section II.B.3 Table A. The language of this note should be further refined to indicate that this is the meaning of a "batch" as identified in Section II.B.3 Table A.	



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#	ODCE Criterion	Document and Reference Section	Permit Language	Shell Comment	EMP Implication
67.		NPDES Geotechnical GP, Table 2, p. 29	Toxicity Testing Note 3: Sample must be collected from the oil-water separator effluent.	<p>This requirement appears to come directly from the EPA’s Exploration GPs for the Beaufort and Chukchi Seas as it is premised on there being a possibility of petroleum contamination from the drilling floor, which has been exposed to materials from the hydrocarbon zone. There is very low likelihood that the decks of geotechnical vessels will be contaminated with petroleum products. The deck of a geotechnical vessel is not equivalent to the drill floor of an Exploration Drilling Rig and the requirements should not be the same.</p> <p>In addition, vessels chartered for geotechnical activities usually do not have their deck drains routed through an OWS and it is not feasible to request that these boats comply with this requirement. These drains are normally routed directly overboard with scuppers to control outfall which is consistent with MARPOL and VGP requirements. As the primary potential source of petroleum contamination onboard a geotechnical vessel is from fuel, lube, and hydraulic sources of the drilling and sampling equipment, the requirements in the draft Geotechnical GP BMP are sufficient to limit the petroleum contamination in deck drainage. These mitigation measures include secondary deck containment around all hydraulically actuated or rotating gears, as well as implementing good housekeeping measures for deck cleanliness. Additionally, as standard practice, Oil Spill Response (OSR) kits are onboard and are located within easy access to address any minor oil spills from the geotechnical gear that could potentially occur on deck and would in all likelihood be cleaned up before any discharge goes overboard.</p>	



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#	ODCE Criterion	Document and Reference Section	Permit Language	Shell Comment	EMP Implication
68.		NPDES Geotechnical GP, Section II.D.1, p. 30	REQUIREMENTS FOR SANITARY AND DOMESTIC WASTES (DISCHARGES 003 AND 004) 1. If authorized, the permittee may discharge sanitary and domestic wastes subject to the effluent limitations and requirements herein. The permittee must comply with the effluent limits in this section at all times unless otherwise indicated, regardless of the frequency of monitoring or reporting required by other provisions of this general permit.	This language makes it sound as though the permittee has the option of complying with either Section II.D.2 or Section II.D.3. Obviously, the option to comply with the MSD requirements included in Section II.D.3 is far less onerous and would be preferable to the requirements of Section II.D.2. The EPA should clarify this is an either/or compliance option.	
69.		NPDES Geotechnical GP, Section II.D, Table 3, p. 31	Fecal Coliform Bacteria Sample Frequency: Weekly Sample Type: Grab	Shell recommends that the EPA modify this requirement to match the ADEC draft Geotechnical GP requirements, which include monthly TRC measurements as well as minimum and maximum TRC concentrations. (AKG283100, page 17). Sanitary waste discharges are not related to a vessel’s geotechnical activities and thus should be regulated in a manner that is consistent with the VGP and or MARPOL. The VGP and MARPOL limits discharges and gives standard concessions for discharging from a certified MSD unit / treatment standards and other requirements contained under Parts 5.1.1 and 5.1.2 or 5.2.1 and 5.2.2 of the VGP permit Annex IV of MARPOL Chapter 3 - Regulation 9. Transport of the fecal coliform samples within the applicable holding time would increase the environmental impact and safety risks associated with a geotechnical program. Additionally, fecal coliform is no better of an indicator of the presence of potentially pathogenic organisms than TRC. The requirement to perform fecal coliform testing of sanitary waste discharges, in addition to the TRC analyses, is onerous and unwarranted and should be removed from the final Geotechnical GP	
70.		NPDES Geotechnical GP, Section II.I, Table 9, p. 31	Fecal Coliform Bacteria Note 5: Must be maintained as close to this concentration as possible. Sample must be collected immediately after chlorination and prior to any commingling of the waste streams. The analytical detection limit for this parameter is 0.1 mg/l.	The language "[m]ust be maintained as close to this concentration as possible" confuses what the actual effluent limits are for TRC. The EPA should clarify and simplify the bacteriological effluent limits. TRC should be able to be used to demonstrate compliance in lieu of fecal coliform, see the ADEC APDES permit requirements. (AKG283100, page 17)	



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71.		NPDES Geotechnical GP, Section VIII.H.1.b, p. 44	CHANGES IN DISCHARGE OF TOXIC SUBSTANCES. The permittee must notify the Director as soon as he/she knows, or has reason to believe... 1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in the general permit, if that discharge will exceed the highest of the following “notification levels”: Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4 -dinitrophenol and for 2 -methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony[.]	This permit language matches neither the EPA's Nationally Recommended Water Quality Criteria nor levels set in the State of Alaska's Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances . Because these discharge notification limits do not match either the federal or state water quality criteria, they appear to be arbitrary . Some of the toxic pollutants with "notification levels" do not even have water quality criteria for the protection of aquatic life in saltwater, e.g. acrolein, acrylonitrile, antimony . A simple statement that the permittee must notify EPA of any real or perceived exceedance of the existing toxic criteria limits would be demonstrably protective of the designated uses.	
72.		NPDES Geotechnical GP, Section VII, p. 65	Geotechnical Facility, for the purposes of this general permit, includes any floating, moored or stationary vessels, jack-up or lift barges with the capacity to conduct geotechnical surveying or related activities (defined above).	As defined, a “geotechnical facility” need not be performing work related to the oil and gas industry. However, throughout the draft Geotechnical GP there is oil and gas specific language. The EPA should be explicit as to the scope of potentially permitted discharges under the draft Geotechnical GP.	
73.		III.I p. 45	Compliance Schedules	It is unclear what is meant by compliance schedules. Shell requests that the EPA clarify what these schedules relate to, what they require, and when they apply.	



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74.		V.I	The permittee must give notice to the Director of the Office of Compliance and Enforcement at the address in Section III.B. as soon as possible of any planned physical alterations or additions to the permitted facility whenever: 1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as determined in 40 CFR § 122.29(b); or 2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in the general permit, nor to notification requirements under Section III.H. (“Changes in Discharge of Toxic Substances”).	Any modification done to a vessel must comply with MARPOL and the VGP and in some situations even be certified by the U.S. Coast Guard. In addition, monitoring and good housekeeping requirements would restrict and limit any increase of pollutants being discharged. This requirement would be onerous if not impossible for a permittee to comply with as vessels that conduct the work described in this permit are not on contract to a permittee year -round. Additionally, the requirement could discourage vessel owners from conducting upgrades to the vessel that could result in better measures to prevent pollution. Shell recommends changing the requirement to state that a permittee must report in its NOI renewal any vessel modifications that increased the quantity of pollutants discharged or that constituted a change that would lead to the vessel being classified as a new source.	
75.		I.C.4	Requirement to submit environmental reports submitted to other agencies for authorization of this activity...	There are a number of regulatory requirements and timeframes that may not line up with the NOI requirement in the draft Geotechnical GP. Shell recommends that the EPA change this requirement to provide that a permittee shall list in the NOI the other authorizations and permits that it will seek coverage under, rather requiring the permittee supply each document. The latter approach could delay when the NOI is deemed complete.	



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76.		Table I footnote 2	2 The permittee must analyze a representative initial sample of drilling fluids from the mud pit prior to commencing geotechnical drilling operations.	It is not feasible or warranted to require a permittee to analyze mud from the pit prior to discharge activities. The mud system can be adequately tested prior to arriving in the Arctic. The parameters that the mud system must maintain in order to ensure that the toxicity limitations will be met will be documented in the DFP. Documentation during drilling activities will illustrate that the drilling fluid systems are mixed in accordance with the SPP toxicity sampling done prior to the season . If a mud system needs to be altered outside of the parameters analyzed in the DFP then additional testing prior to discharge is warranted. It is not warranted for a vessel to test a mud system, mobilize to the arctic, arrive on location, mix mud, test again and then be required to wait on site for several days prior to being able to discharge any material.	
77.		Table I footnote 7	The discharge of drilling fluids or drill cuttings generated using drilling fluids which contain diesel oil is prohibited. Compliance will be demonstrated by gas chromatograph (GC) analysis of drilling fluid collected from the drilling fluid used at the greatest borehole depth.	This requirement appears to have come directly from the EPA’s Exploration GPs for the Beaufort and Chukchi Seas. Because geotechnical activities will not penetrate hydrocarbon zones, compliance with the no oil sheen should not be required as written. Compliance should be demonstrated by performing a static sheen test on the drilling fluids and further supported by the chemical inventory requirements already required in the general permit.	
78.		p. 29 C.2	The permittee must separate area drains for washdown and rainfall that may be contaminated with oil and grease from those area drains that would not be contaminated so that the waste streams are not commingled.	This requirement appears to have come directly from the EPA’s Exploration GPs for the Beaufort and Chukchi Seas. Because geotechnical activities will not penetrate hydrocarbon zones, there will not be contaminated petroleum cuttings on the drilling floor. This requirement should be removed from the permit. Compliance should be demonstrated by performing a static sheen test on representative grab samples from the deck floor prior to discharging.	



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79.		p. 29 C footnotes	Once per discharge event, the permittee must sample deck drainage discharges that are processed through an oil -water separator and test for sheen using the static sheen test in accordance with Appendix 1 to Subpart A of 40 CFR Part 435, Static Sheen Test. During periods of discharge, the permittee must also conduct a visual observation for visual sheen as determined by the presence of a film or sheen upon or a discoloration of the surface of the receiving water.	This requirement appears to have come directly from the EPA’s Exploration GPs for the Beaufort and Chukchi Seas. Because geotechnical activities will not penetrate hydrocarbon zones, there will not be contaminated petroleum cuttings on the drilling floor. This requirement should be removed from the permit. Compliance should be demonstrated by performing a static sheen test on representative grab samples from the deck floor prior to discharging.	
80.		p. 31 Footnote 4	If inclement weather conditions affect timely deliveries of samples, the permittee must notify EPA within 24 hours document the conditions and rationale in the following monthly DMR.	The EPA seems to acknowledge in this note that fecal coliform sampling is not feasible for an Arctic offshore geotechnical program. However, simply allowing a permittee to notify the EPA in the event of inclement weather does not alter the fact that weather limitations will routinely result in a permittee being unable to comply with this permit provision. Shell recommends that the EPA allow for TRC to demonstrate compliance with this requirement. Shell also recommends adding language similar to the footnote on Table 4 that monitoring is only required if a discharge occurs that day.	
81.		pH and toxicity sampling requirements	on almost all discharges	Shell recommends removing pH and Toxicity testing for general vessel discharges. Environmental protection will be sufficiently ensured if these discharges are regulated in a manner consistent with MARPOL and the VGP. These testing requirements are onerous for a permittee and are of no benefit to the environment. See Comment V in attached letter.	
82.					